National Park Service
U.S. Department of the Interior
Pacific Coast Science and Learning Center
Research Project Summary April 2006

Butterflies and Moths at John Muir National Historic Site

The Question: *What species of Lepidoptera (moths and butterflies) are present on the Mt. Wanda unit of the John Muir National Historic Site?*

Data from an inventory of the vascular flora at John Muir National Historic Site (JOMU) completed in 2002 suggest that Mt. Wanda may be home to a rich array of Lepidoptera due to an abundance of nectar and host plants (over 280 native and non-native vascular plants). There is some concern that the lack of grazing on Mt. Wanda is increasing the biomass of non-native grasses resulting in a decrease of native flowering plant abundance through shading and competition. These mechanisms may impact the insects that use these species as a host, nectar and/or pollen source. This survey was designed as a baseline inventory which may be used for future local and regional studies.

Butterflies and moths were collected using a variety of methods during 2003 and 2004.

The natural area at JOMU, Mt. Wanda, is approximately 325 acres and is unable to support populations of many large animals due to the small size. However, populations of small animals such as invertebrates may endure and even thrive on small patches of intact habitat. Lepidoptera is an ideal group of invertebrates to inventory because the species are relatively well-described, easy to identify, and well-liked by the public. Furthermore, their close association with plants makes them good indicators of the health of vegetation, so they may be a key component of a vital signs monitoring program.

The Project: *Use multiple methods of sampling to detect as many moths and butterflies as possible over different seasons and in different habitats.*

www.images.google.com

The rural skipper (*Ochlodes agricola*) is one of 35 species of butterflies documented at John Muir National Historic Site.

Method for butterflies: Butterflies on Mt. Wanda were inventoried in a variety of ways from April 2003 to October 2004. In most instances butterflies were collected opportunistically by National Park Service biologists. In some instances habitat, season and time of day were used to find certain butterfly species that were not as easy to locate as the common or showy species. Three butterfly counts were held during the inventory, often resulting in new species (July 2003, June 2004 & 2005). Volunteers from the North American Butterfly Association have been active participants in the butterfly counts each year.

Method for moths: Moths were captured and identified from September 2003 to September 2004 during two to three nights surveys coinciding with the new moon of each month. One light-trap consisting of a black light, collection bucket and ethyl acetate was installed at various sampling sites on Mt. Wanda (normally 2- 3 sites per night). All collected Lepidoptera were examined, sorted, and pinned for identification to species when possible.

The Results: *35 species of butterflies and over 147 species of moths have been identified on Mt. Wanda.*

Thirty-five species of butterflies were detected on Mt. Wanda during the survey. Over 2,800 individual moths were captured during the year of repeated sampling on Mt. Wanda. Eighty-three collection events at 26 locations on Mt. Wanda took place during the sampling period for moths. Specialists documented at least 194 unique taxa and positively identified 147 species. Of the specimens identified to the species level, 31 are new records for Contra Costa County. One of the moth specimens collected on Mt. Wanda is likely a new species to science in the genus *Amydria*.

Acknowledgements

Paul Johnson, PINN wildlife biologist, confirmed butterfly identification. Moth identification was conducted through Jerry Powell at UC Berkeley, and included assistance from Peter Jump.

Additional Resources

San Francisco Bay Area Inventory and Monitoring Program:
www1.nature.nps.gov/im/units/sfan/index.htm

North American Butterfly Assoication:
http://www.naba.org

Family	Scientific Name	Common Name
Herperiidae	*Erynnis propertius*	Propertius duskywing
	Erynnis tristis	Mournful duskywing
	Ochlodes agricola	Rural skipper
	Ochlodes sylvanoides	Woodland skipper
	Poanes melane	Umber skipper
	Pyrgus communis	Common check'd skipper
Lycaenidae	*Callophrys augustinus*	Brown elfin
	Celastrina ladon	Spring azure
	Glaucopsyche lygdam	Silvery blue
	Lycaena xanthoides	Great copper
	Plebejus acmon	Acmon blue
	Strymon melinus	Gray hairstreak
Nymphalidae	*Adelpha bredowii*	California sister
	Cercyonis pegala	Common wood nymph
	Chlosyne palla	Northern checkerspot
	Coenonympha tullia	Common ringlet
	Danaus plexippus	Monarch
	Euphydryas chalcedon	Variable checkerspot
	Junonia coenia	Common buckeye
Nymphalidae	*Limenitis lorquini*	Lorquin's admiral
	Nymphalis antiopa	Mourning cloak
	Phyciodes mylitta	Mylitta crescent
	Vanessa annabella	West Coast lady
	Vanessa atalanta	Red admiral
	Vanessa cardui	Painted lady
	Vanessa virginiensis	American lady
Papilionidae	*Battus philenor*	Pipevine swallowtail
	Papilio eurymedon	Pale swallowtail
	Papilio multicaudata	Two-tailed swallowtail
	Papilio rutulus	Western tiger swallowtail
	Papilio zelicaon	Anise swallowtail
Pleridae	*Anthocharis sara*	Sara orange-tip
	Colias eurytheme	Orange sulfur
	Euchloe ausonides	Large marble
	Pieris rapae	Cabbage white

Table 1. Butterfly species documented for Mt. Wanda during Lepidoptera Inventory.

For More Information

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